

Coordinating Earth Observing System Land Validation

The National Aeronautics and Space Administration's (NASA's) Moderate Resolution Imaging Spectroradiometer (MODIS) land product validation project, initiated prior to the launch of the NASA Earth Observing System (EOS) Terra platform in late 1999, provides data, instrument, and information resources for the validation of products that quantify land surface characteristics from MODIS and other satellite sensors. Land prod-

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ucts derived from MODIS and other moderate-resolution sensors include, among others, land cover, snow cover extent, surface temperature, leaf area index, fire occurrence, and vegetation productivity.

The land validation project infrastructure, developed at NASA's Goddard Space Flight Center (GSFC), involves an integration of NASA-funded researchers, international collaborators, and science data networks. These resources facilitate determination of product uncertainty, which is the definition of validation, through best practice methods.

Key to the project is the set of EOS Land Validation Core Sites, a global network of 33 sites (including six added in 2006), which serve as a focus for validation activities. The initial infrastructure and activities were described in *Morisette et al.* [1999], *Justice et al.* [2000] and *Morisette et al.* [2002].

The present article provides an update on two components of the project: delivering validation status information on MODIS land products and providing Core Site data and information (Figure 1).

MODIS Land Team Validation Information and Core Site Infrastructure

The primary objective of the MODIS Land Team validation activities is to provide quantitative assessment of land product accuracy.

On the Land Validation Web site (<http://landval.gsfc.nasa.gov>), summarized product accuracy information is given in a validation status page for each product. Each product status page provides a brief validation statement and a list of reference material, each element of which is linked to its own subsequent page with a full reference, an abstract, and sample results (usually figures or tables). Much of the supporting material for the product accuracy statements has been generated from data and fieldwork conducted at Core Sites.

Though designed to support MODIS land product validation, the Core Site data and infrastructure provide a valuable resource that has been useful to researchers through-

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* NASA GSFC, in conjunction with the University of Maryland, has utilized aerosol optical property data (available through AERONET [Holben *et al.*, 1998]) and the Second Simulation of the Satellite Signal in the Solar Spectrum (6S) modeling software [Vermote *et al.*, 1997] to atmospherically correct 60 kilometer \times 60 kilometer subsets extracted from 44 Landsat ETM+ scenes over 14 Core Sites [Morissette *et al.*, 2004].

Maintaining this validation resource will allow future missions, such as the National Polar-Orbiting Operational Environmental Satellite System, to capitalize on NASA's EOS pathfinding. To that end, we are investigating opportunities to further coordinate EOS Core Sites with long-term observing networks such as the National Oceanic and Atmospheric Administration's Climate Reference Network (CRN), which will provide sub-hourly field data for a nominal 50-100 year period. It is

Holben, B. N., et al. (1998), AERONET: A federated instrument network and data archive for aerosol characterization, *Remote Sens. Environ.*, 66(1), 1–16.

Justice, C., A. Belward, J. Morisette, P. Lewis, J. Privette, and F. Baret (2000), Developments in the validation of satellite products for the study of the land surface, *Int. J. Remote Sens.*, 21(17), 3383–3390.

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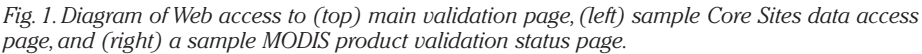


Fig. 2. Summary of Core Site data availability. Colored areas indicate where data are available. Numbers within boxes indicate the number of acquisitions for given site.